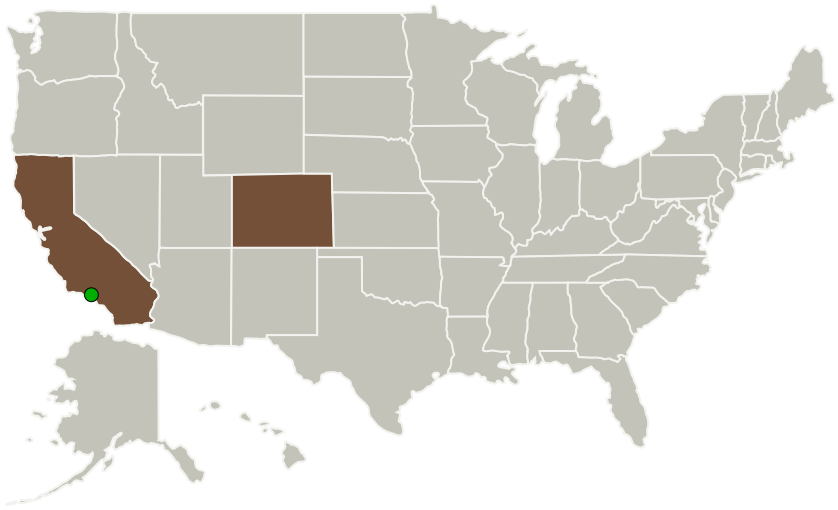
Calibration/Validation Technology for the CO2 Satellite, Phase I

Completed Technology Project (2010 - 2010)

Project Introduction

We are proposing to develop high altitude CO2 analyzer technology that can be deployed on the research aircraft of NASA's Airborne Science Program (ASP). The ultimate scientific goal is the calibration/validation of CO2 observations made from spacecraft. Two forms of the analyzer are to be developed, pod for unmanned aircraft and rack for more general purpose platforms. The CO2 payloads are small and light enough to perform on all 15 platforms of NASA-ASP, some reaching altitudes of more than 65,000' ASL and capable of probing at least 95% of the atmospheric column. By prior work, we have built a prototype having the appropriate levels of sensitivity (0.10 ppmv), bias (<0.10 ppmv) and spatial/temporal resolution (1 Hz). Consequently, we can initiate our program with Technical Readiness Level (TRL) 5-6. Validation of the prototype was on a piloted aircraft by a second airborne AOS analyzer system of the same specifications and by flask samples analyzed by NOAA/GMD. Observations, some reaching altitudes of 26,000' ASL, were referred to the WMO scale of CO2 DMF by use of reference gases. As a result of prior technological and scientific work, our Phase I program can present a detailed plan for achievement of TRL 9.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Atmospheric Observing Systems, Inc.	Lead Organization	Industry	Boulder, Colorado
Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations	
California	Colorado

Project Transitions

January 2010: Project Start

July 2010: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140005)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Atmospheric Observing Systems, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

James Smith

Co-Investigator:

James D Smith

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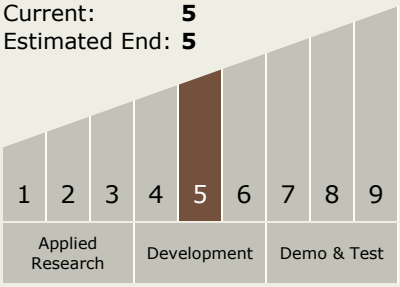
Technology Maturity (TRL)

Start: **5**
Current: **5**
Estimated End: **5**



Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.3 In-Situ Instruments and Sensors
    - TX08.3.4 Environment Sensors

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System